



CALIFORNIA
ACADEMY
OF SCIENCES

Annual Report 1996-1997

Before I joined the Board, my family and I – like hundreds of thousands of other Bay Area families each year – experienced the work of the Academy only through its more visible public facets...its remarkable natural history museum, Steinhart Aquarium, and Morrison Planetarium.

What amazing insights into the natural world these sister institutions provide. In addition to featuring materials from the Academy's own 15 million specimen collections, the Natural History Museum attracts important national traveling exhibitions like Jurassic, Amber and Spiders. The Morrison Planetarium remains the primary source of inspiration and information for thousands of Bay Area comet-watchers, star-gazers and amateur astronomers riveted by an endless universe. The Steinhart Aquarium, with its wealth of live specimens, ranks second only to the Shedd Aquarium in Chicago.

One million people visit this trio of institutions every year; nearly one-third of them are children. Because the Academy is dedicated to engaging both intellects and imaginations, the staff works continuously to ensure that the methods used to help visitors explore the natural world remain on the cutting edge of science and learning. Visitor experiences are further enriched by expertly trained docents, adept at translating complex natural phenomena into meaningful information.

While these public facets of the Academy remain a source of great pride, they constitute only a fraction of its efforts.

The Academy is unique: it is the only natural sciences institution in the nation combining a planetarium, aquarium, natural history museum, research facility and full scale educational program under one roof.

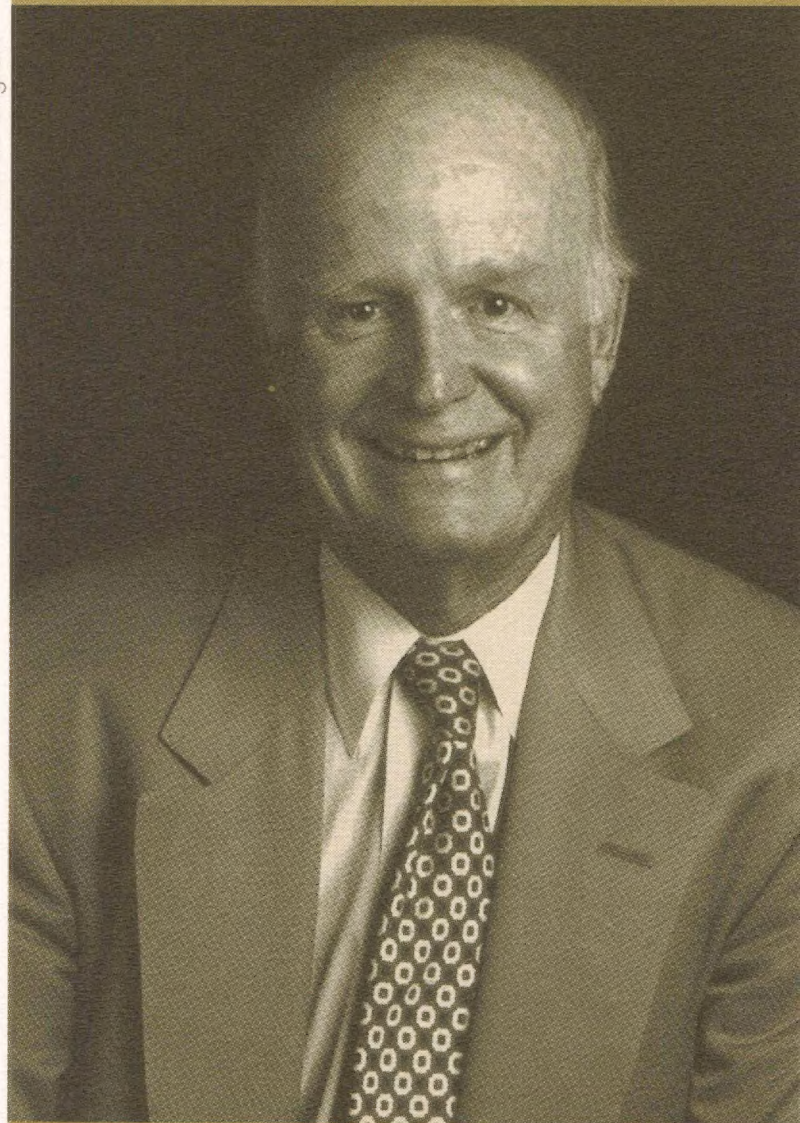
The Academy's
worldwide
research efforts,
its devotion to
nurturing the
next generation
of ecologists,
conservationists

and systematists, and its vigorous defense of biodiversity – in the Bay Area and worldwide – are the lifeblood, sinew, and bone of this historic institution.

Since 1853, it has been the Academy's mission to "explore and explain the natural world." Thus, the expeditions of, for example,

CHAIRMAN'S MESSAGE

Mr. W. Richard Bingham



Checkerspot butterfly, *Occidryas*



The mission of the
California Academy of Sciences
is to explore and explain
the natural world.



Day gecko, *Phelsuma*



Song sparrows, *Melospiza melodia* Susan Middleton



Free day fun

Peter Fritsch in China and of Gary Williams and Terry Gosliner in the Philippines are direct descendents of the Academy's seminal 1905-06 expedition to the Galápagos.

Generations of scientists, board members, volunteers, staff members and donors have all played their part in extending the Academy's important mission. This generation of scientists, board members, volunteers, staff members and donors has done no less. We spent the 1996-97 fiscal year exploring and explaining the natural world and formulating how the Academy can best continue to perform its unique role in a new century.

Looking ahead to that new century, we are pleased at the important improvements looming on the horizon. With the decision to remain in Golden Gate Park behind us, and the advent of Proposition J which authorizes the building of a privately funded underground parking facility in the Museum Concourse, the Academy has thrown itself into the effort to renew its public spaces and permanent exhibitions.

We encourage those who – through their interest, intellect, time and support – have shared in the work of building one of this nation's greatest community-based scientific institutions to review the accomplishments of the year past and to join in the work of the years to come. We believe you will agree: the past is glorious and the future is bright, indeed.

W. Richard Bingham

W. Richard Bingham

Gathering plant and animal specimens, fossils, and DNA and photographic evidence from the world's swamps, forests, jungles, deserts, alpine peaks, and oceans, Academy scientists in eight areas of specialization may call the Bay Area home; but, in truth, they are esteemed members of an international community of systematists...at home everywhere from the Americas to Zimbabwe. Their global research drives everything else the Academy does.

The expeditions

A new weapon in the battle against cancer is what the National Cancer Institute hopes Dr. Terry Gosliner will find in the seas of the tropical Pacific. If he does, the discovery will come disguised as a sea slug. Gosliner is an authority on these bright inhabitants of the Indo-Pacific deep. During a 1997 expedition to the Philippines with colleague Dr. Gary Williams, Gosliner identified and photographed 200 opisthobranch species, including 100 previously unknown. Williams photographed 150 species of soft corals, some previously unidentified. The high percentage of undescribed species in their samples suggest hundreds, even thousands, more of both kinds of animals may yet be discovered.

Botanist Dr. Peter Fritsch, one of the Academy's most recently hired curators, is beginning to unlock the mysteries of a rare, little-studied tree from which pharmaceutical-grade benzoin is derived. Of the 12 genera comprising the silverbell family of flowering plants, 10 are found only in east Asia. Two, however, are also found in North America (one in California). Having collected representatives of most of these genera from southern China last year, Fritsch's analysis via molecular sequencing led him to the discovery that certain Chinese and eastern North American species are very near relations. Tracing changes in the DNA allowed him to infer both the timing and direction of global migration of members of this group. (Alaska had a much warmer climate than it does today, and there was a land bridge linking Asia and North America.)

Ornithologist Dr. Luis Baptista – who won the University of San Francisco's 1997 Furst Award for "outstanding research advancing science for the betterment of humanity" – continued his 30 year study of evolving white-crowned sparrow songs and tagged birds in various parts of San Francisco.

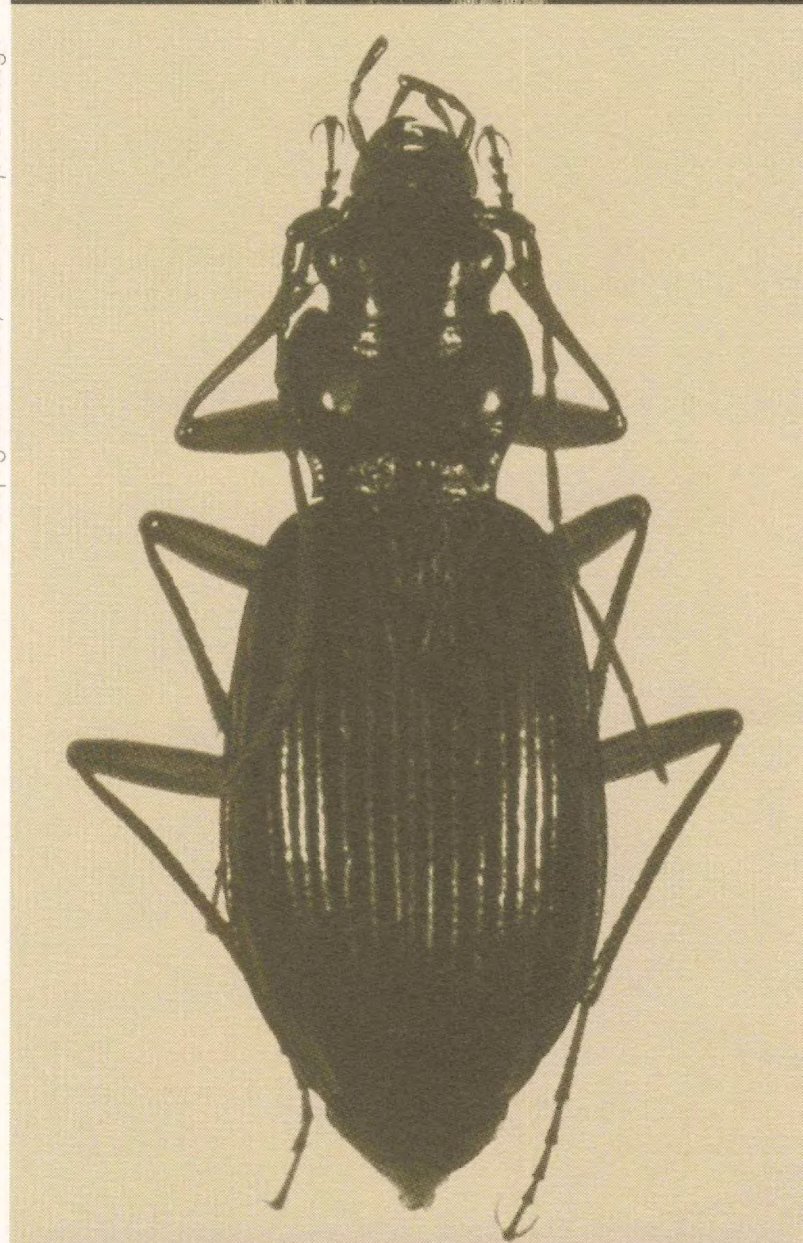
Dr. David Kavanaugh's 27 year study of one genus of predaceous ground beetle, *Nebria*, led him back this year to Northeastern Arizona to again seek living examples matching two specimens of ground beetle discovered in the '30s. None of the shy creatures had been located since. On his third – and, he swears, final – expedition into the Arizona canyons in search of this particular

RESEARCH

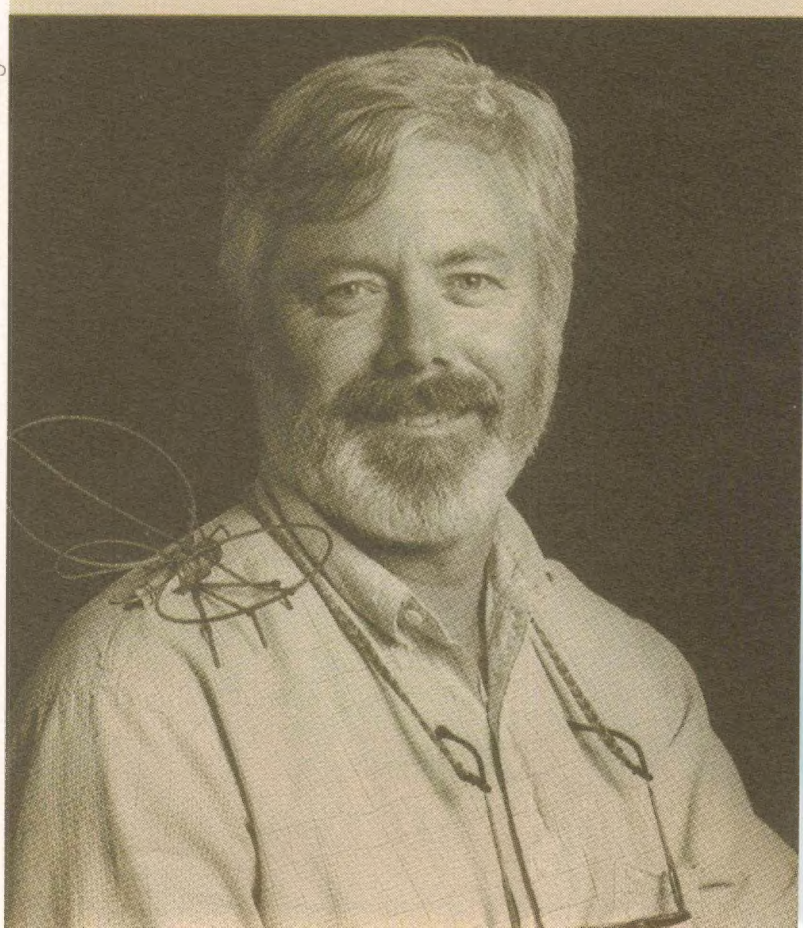
Dr. Terry Gosliner



Navajo gazelle beetle, *Nebria navajo* Kavanaugh

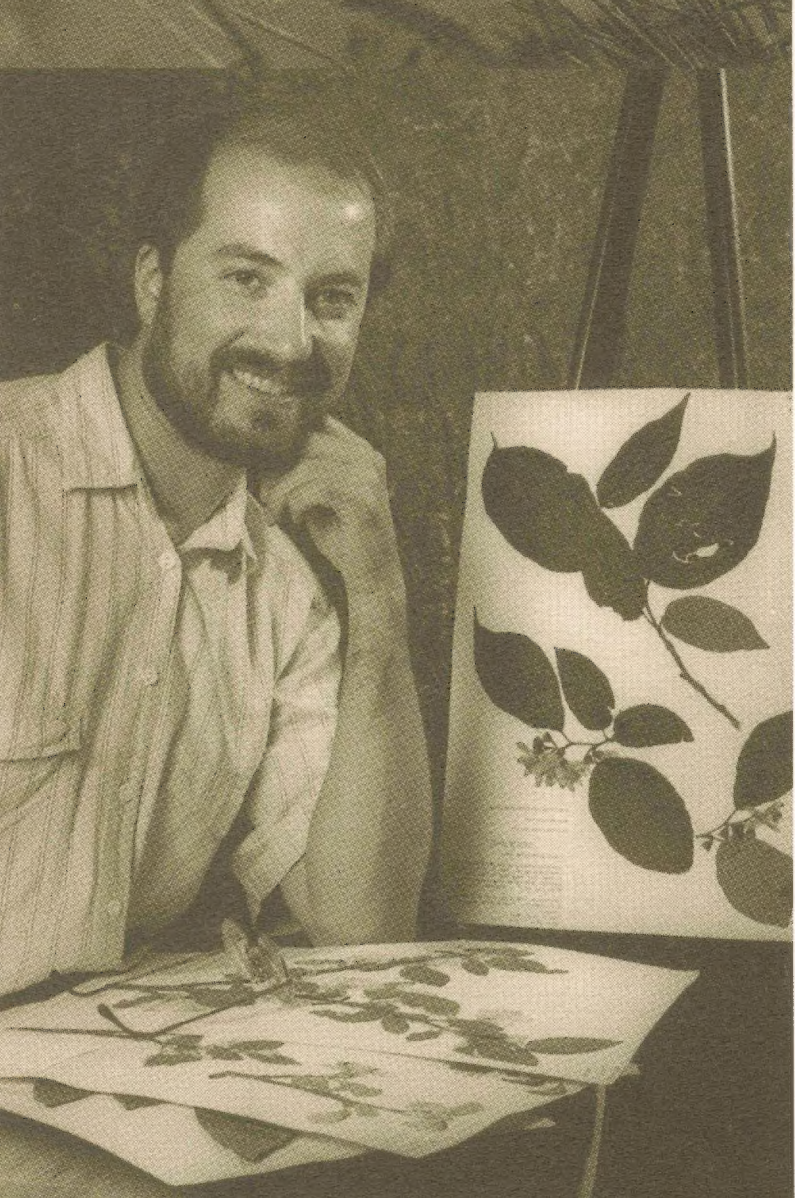


Dr. David Kavanaugh

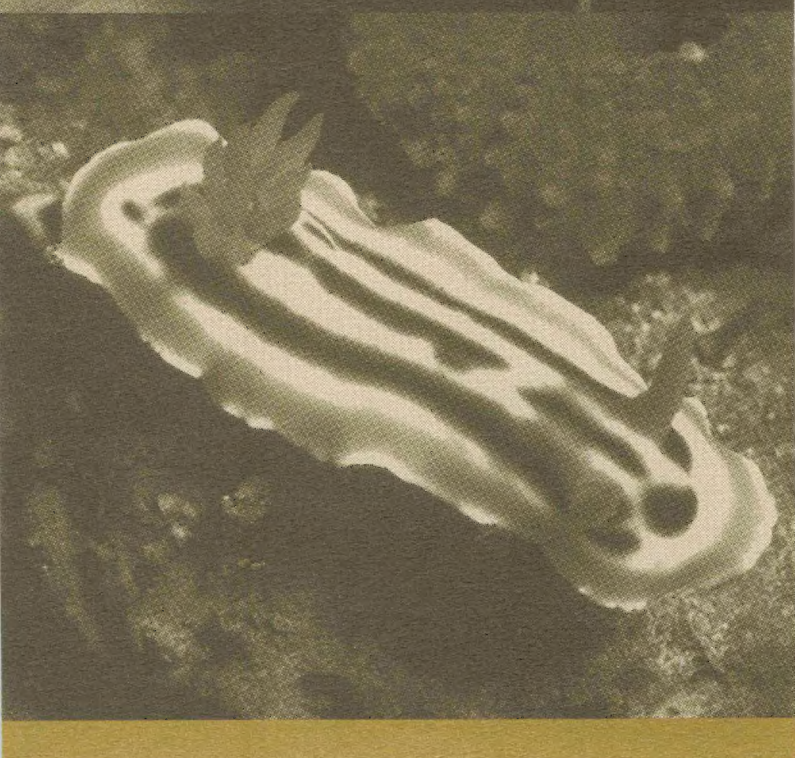




White crowned sparrow, *Zonotrichia leucophrys* Susan Middleton



Dr. Peter Fritsch



Sea slug, *Chromodoris magnifica* Terry Gosliner

beetle, Kavanaugh found a living example of the “glacial relic.” It was also, as it turned out, the first known female of the *Nebria navajo* ever discovered.

Ichthyologist Dr. Tomio Iwamoto spent three weeks gathering fish and invertebrate samples in New Caledonia. Botanists Dr. Tom Daniel and Dr. Frank Almeda collected specimens in the Trinity Alps of California, in southern Mexico and west Texas, and the DNA of several plant species in Brazil, respectively. In total, Academy scientists launched more than 50 expeditions to countries around the globe and added to the Academy’s definitive collections, which now number nearly 15 million specimens.

Serving biodiversity and its advocates

Collections steadily amassed since the Academy’s founding in 1853 serve as tools for further research and for teaching, not just here but around the world. Specimens from the Academy’s 1905-06 expedition to the Galápagos – the basis of the most important collection of Galápagos flora and fauna in the world – have, for example, proven invaluable to a team of conservation biologists from Duke and other universities seeking to restore the islands to “pre-contact” condition. The habitat has changed so much since Darwin’s 1835 visit that determining what its “pristine” condition was would be impossible were it not for the Academy’s collection and the tangible portrait of a vanished ecosystem it reveals.

The Academy and its Curator of Echinoderms Dr. Richard Mooi further served the scientific community by hosting the Ninth International Echinoderm Conference in Fall, 1996. Echinoderms – starfish, sea lilies, sand dollars, sea urchins and sea cucumbers – inhabit shallow-water tide pools and ocean depths of up to five miles. The impact and regulation of echinoderm fishing worldwide, the origins and evolutionary diversification of the phylum, and the importance of a collagen with probable medical applications that is found only in echinoderms were among the topics investigated by more than 250 biologists from around the world.

Training tomorrow’s systematists

Academy scientists are among the most respected systematists in the world. Their collections, knowledge and experience support international biodiversity research and advanced education.

The Academy and San Francisco State University, for example, launched a joint graduate program in Systematics, Ecology and Conservation Biology at the university and at the Academy. Academy curators now hold dual appointments at the Academy and on the SFSU faculty and serve as major advisors; their students spend much of their time at the Academy working with its collections. A biosystematics course is also now being offered at Stanford University by Dr. Gosliner and Dr. Nina Jablonski.

In 1997, the National Science Foundation underwrote the second year of Summer Systematics Institute, which brought seven undergraduates from universities across the U.S., as well as three Philippine researchers funded by their government, to San Francisco for hands-on training in systematics.

Other budding scientists benefited from the Robert T. Wallace Undergraduate Research Internship; the Wallace intern Robyn Draheim collaborated with Dr. Gosliner on the publication *"How Do We Know What We Don't Know?"* Other students were the beneficiaries of the Academy Fellows' Biological Illustration Internship and the new A. Crawford Cooley Internship in California Botany, established in 1997.

Support for new initiatives

While the work of the Academy has long been supported by diverse government, corporate and individual donors, the announcement that Oracle Corporation had agreed to fund fieldwork in Madagascar was particularly gratifying. To cultivate support for and understanding of biodiversity, the Academy will launch the Center for Biodiversity Research and Information in the Fall, 1997. Its proposed inaugural project was a five year survey of flora and fauna on the island of Madagascar and, ultimately, an achievable program to preserve one of the richest and most endangered environments on earth.

Research: 1996/97 at a glance

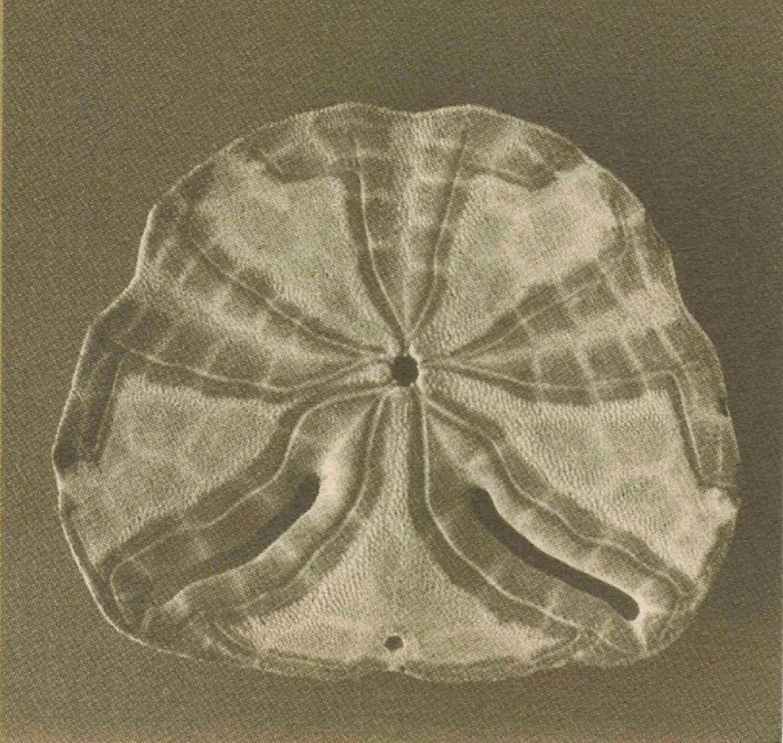
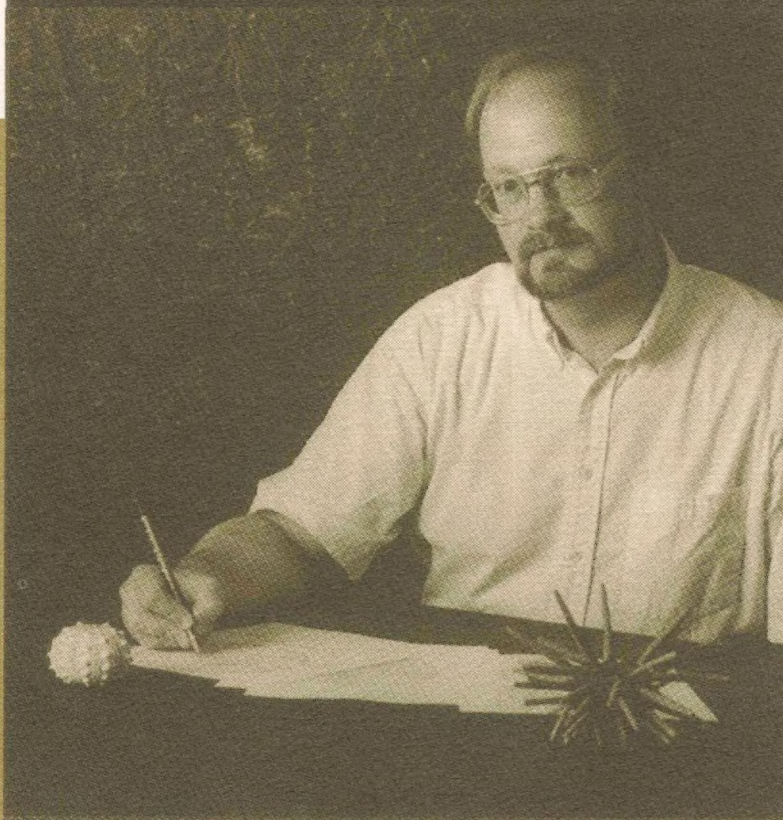
- Departments conducting original research: anthropology, aquatic biology, botany, entomology, herpetology, ichthyology, invertebrate zoology & geology, ornithology & mammalogy
- Research projects underway: 20 scientists are conducting studies in 52 countries
- Size of collections: 14.8 million fossils, plant and animal specimens and artifacts; 185,000 volumes in the main and eight departmental libraries
- Specimens loaned to educational institutions and other scientists: 34,785
- Number of visiting scientists: 773 representing 28 countries
- Interns and other students trained: 57
- Total number of departmental visitors: 3,584
- Volunteer support: 88 volunteers performed 8,478 hours of work
- Seminars, lectures and other educational presentations made: 72
- A number of departments updated and posted collection inventories at the Academy web site (www.calacademy.org), an increasingly valuable tool for researchers worldwide.

Galápagos land iguana, *Conolophus* Terry Gosliner

Sea star, *Oreaster reticulatus* Susan Middleton

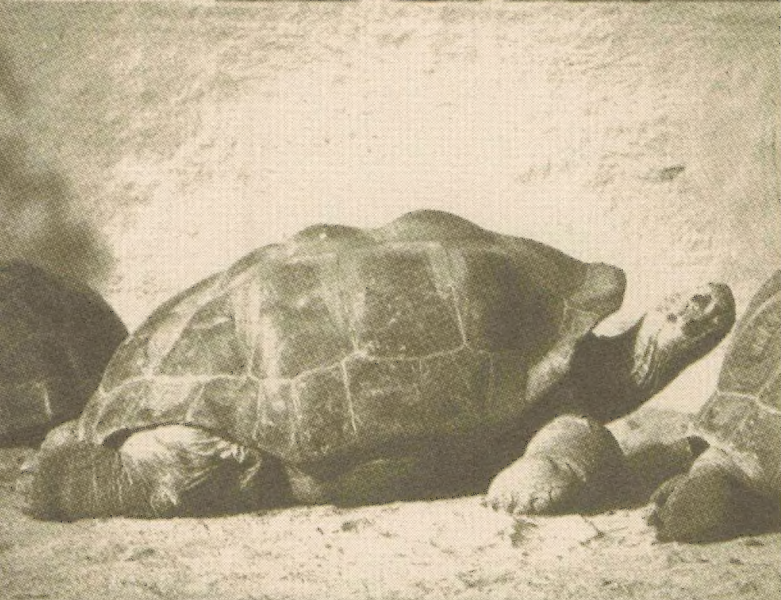
Dr. Richard Mooi

Sand dollar, *Echinodiscus bisperforatus* Richard Mooi

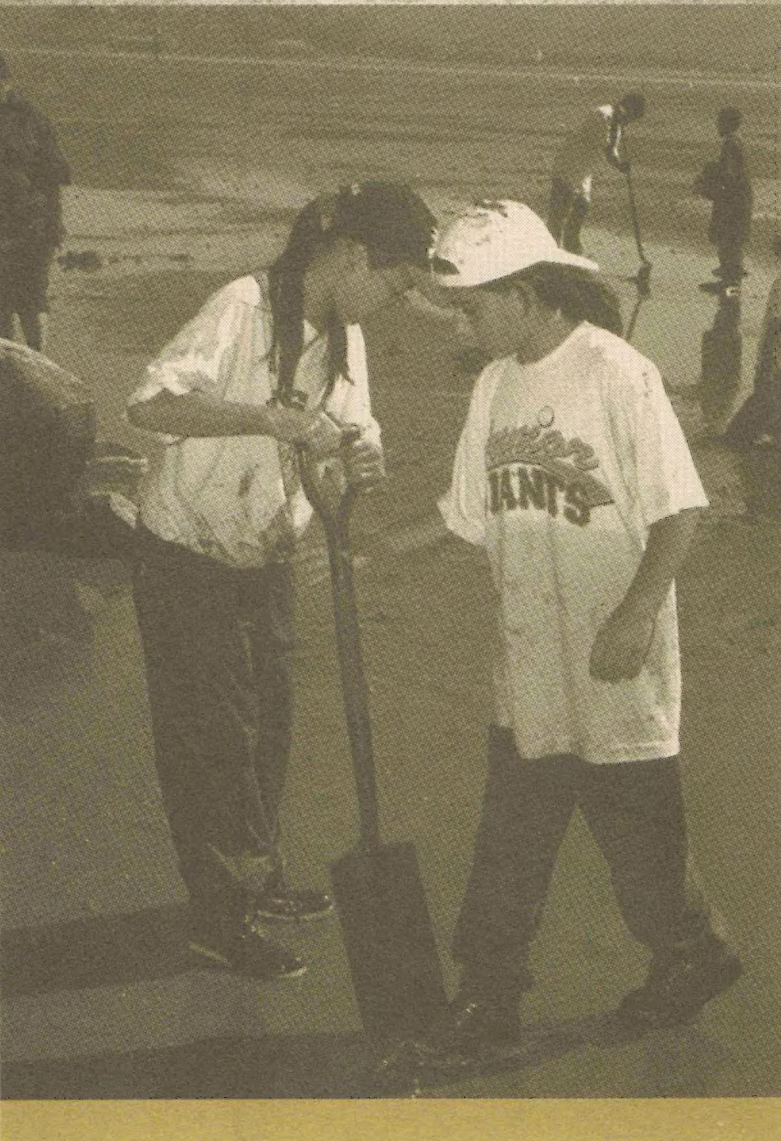




Science at Shoreline students at Mountain View



Aldabran tortoise, *Geochelone gigas* Brell C. Sievers



Camp Academy at Bodega Bay

Each year, the California Academy of Sciences unlocks the secrets of earth, ocean and space for throngs of individuals, families and pre-school, elementary, middle, high school and college students and their science teachers. The Academy's education program is significant not merely for its size, however, but also for its innovative approaches to improving science literacy.

These innovations increasingly are based upon community partnerships that break new ground in cross-disciplinary cooperation.

Cultivating young scientists

Science at Shoreline – a collaboration involving Alza Corporation, Shoreline at Mountain View, and the students and teachers of Crittenden Middle School in Mountain View – is among the Academy's newest creative educational ventures.

Funded and designed during the 1996-97 year, Science at Shoreline is an unique four-way cooperative venture

EDUCATION

which overlaps the needs and resources of a school, a city park, the Academy, and several hundred middle and elementary school science students. The first such alliance of a corporation with a city, school and museum education department, the program will not only benefit Crittenden students but has been designed to serve as a model for other communities and schools.

When the program is fully implemented, a semester of classroom instruction and field trips to Shoreline's restored tidal marshland will literally immerse 60 Crittenden Middle School students in shoreline science. As a result of this training, the middle school students will become "docent instructors" for 320 elementary school students slated to visit the tidal preserve as part of an unusual "peer mentoring" program.

Another program for youth in San Francisco pairs Academy scientists and educators with about two dozen interns recruited from San Francisco high schools and community organizations serving low income families. Teens learn biology and public presentation skills while they're employed as interpreters in the museum, presenters in school/community outreach programs, counselors at Camp Academy, and aides in the research division. A diverse group, many speak languages other than English. Their linguistic skills coupled with their scientific knowledge expands the Academy's capacity to serve audiences throughout the Bay Area.

Making science live

Youth and adult docents alike have their hands full as an array of enriching science programs for students ages 6 to 16 keeps the Academy – and its satellite sites – teeming with youngsters.

The 1996 Camp Academy transported nearly 300 children from San Francisco Parks and Recreation programs, “latchkey” sites, community centers and homeless shelters to the wide open spaces of Pepperwood Nature Preserve in Sonoma County and to the tidepools of the Bodega Marine Sanctuary for five-day intensives in botany, marine biology, and other aspects of California’s natural history. Almost two-thirds of the children were supported by full scholarships provided by corporate sponsors.

Hundreds of Junior Academy presentations, adult and family classes, field trips, mushroom and wildflower hunts, Internet explorations, and backpacking adventures led by Academy scientists, university faculty, and local naturalists made scientific phenomena come alive for more than 5,000 adults and children. A summertime, weekend and holiday science educator as well as the exciting destination of numerous schoolday field trips, the Academy also takes natural history workshops and classroom presentations to Bay Area schools and community centers throughout the school year. Some thrilling presentations even feature live animals! Nearly 8,000 students and teachers benefited from such outreach programs in the 1996-97 fiscal year.

Teaching the teachers

Even when the Academy’s “presence” is invisible, however, Bay Area students and their teachers benefit from its expertise. Six teachers selected for the Academy’s annual “Teacher-in-Residence” program, for example, worked side-by-side with Academy docents in a two-week workshop aimed at helping teachers make the most creative use of Academy exhibits. At the same time, the Academy fine-tuned its guided tours to better meet teachers’ needs.

Hundreds of Bay Area science teachers participated in three different, day-long BioForums sponsored by Genentech. Now in its 13th year, the BioForums bring together teachers, Academy researchers and other scientists. Last year’s discussion topics included: communication in plants and animals, molecular genetics, and the off-shore marine environments of California and the Galápagos. Through a partnership with Genentech’s Access Excellence program, the entire proceedings – video and audio, still images, and presentation transcripts – of each BioForum were made accessible on the Internet.

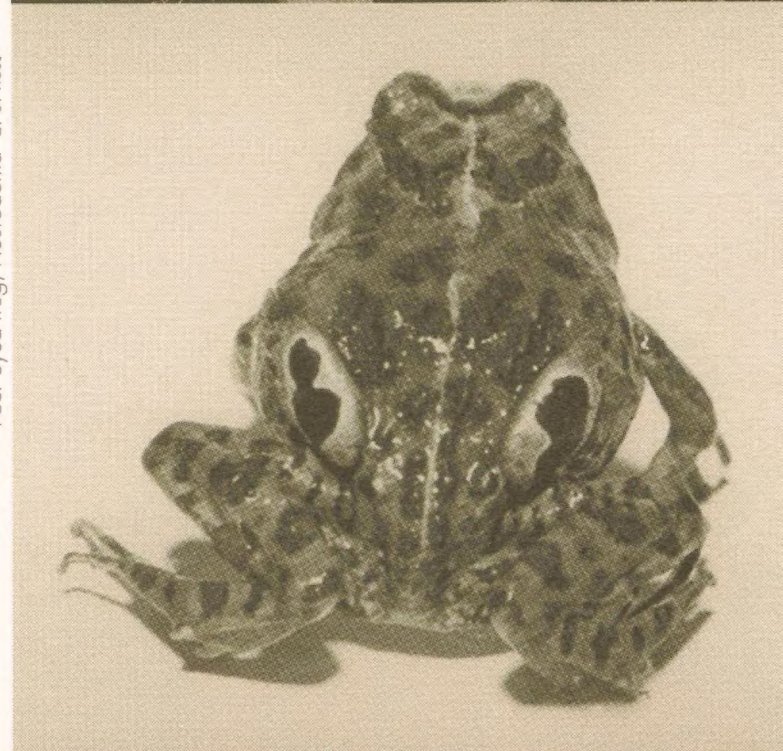
Rewarding teaching excellence

Excellence in science teaching also got a boost from the new “Chevron Education Award,” underwritten by Chevron Corporation and developed and administered by the Academy in collaboration with the National Science Foundation (NSF). This national awards program identifies and rewards teachers nationwide who have developed innovative and effective classroom lesson plans for science and math instruction. At the inaugural awards ceremony at the U.S. Capitol in October, 1997, 16 outstanding teachers were recognized, 5 of them from California.

BioForum presenter, Dr. Robert Wayne



Four eyed frog, *Pleurodema* E. S. Ross



Camp Academy at Pepperwood





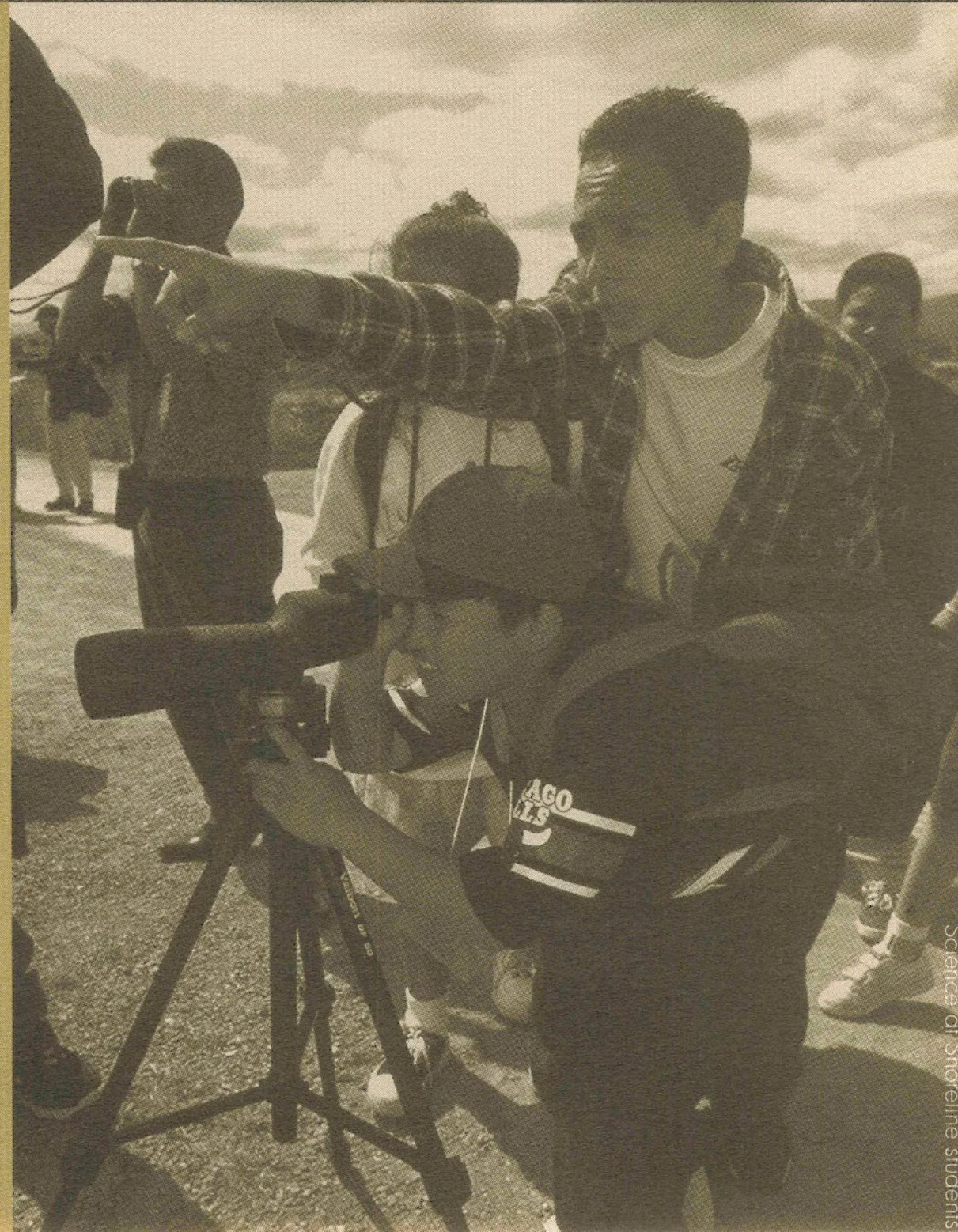
Science at Shoreline Students



Camp Academy at Bodega Bay

Education: 1996/97 at a glance

- Number of classes for adults/families: 213 with an audience of 3,706
- Number of classes for children: 151
- Number enrolled in Junior Academy and Camp Academy: 1,862
- Number of school outreach visits: 203 locations reaching 7,971 students
- Number of teachers enrolled in BioForums: 382
- Lecture series: 23 presentations to audiences totaling 7,364
- Volunteer support: 282 docents contributed 11,537 hours leading tours for 24,430 people



Science at Shoreline Students

Drawn by the gem-like brilliance of tropical fish, the transitory flare of a comet, the gleam of amber, and the chance to travel back in time, nearly a million visitors explored Earth's wonders through the Academy's natural history museum, Steinhart Aquarium, and Morrison Planetarium in one year alone.

Constantly updated displays in the permanent exhibit areas are becoming increasingly interactive and multi-media-based. No matter how contemporary the approach or sophisticated the media, however, nearly a century and a half of scientific exploration furnishes the content for these public manifestations of the Academy's scientific explorations and achievements.

The Natural History Museum

Displays are no longer static and education no longer passive. A newly added parabolic microphone, which can be pointed at a diorama in the updated African Hall, reproduces the sounds of each bird within. Mounted, "please touch" antelope horns add a tactile element. A videotape of Academy scientists – like Dr. Robert Drewes, one of the world's foremost authorities on African tree frogs – lend depth. Books, computer activities, stereoscopes and other resources further enrich the experience.

A new African Experience, an early childhood learning center, has been created off African Hall. The area supplies objects, exploratory games, and costumes for the scientific explorations of young children.

Traveling exhibits enjoyed staggering popularity. The movie props and behind-the-scenes technology of Jurassic Park attracted more than 215,000 visitors, many of them avid, well-informed youngsters. Developed by the Dinosaur Society, Jurassic Park compared revelations of the fossil record with Hollywood's version of prehistoric times.

Amber: Window to the Past was to adult museum-goers what Jurassic was to youngsters. The 6,000 square-foot exhibit – the most comprehensive amber exhibit ever mounted – was developed by the American Museum of Natural History and appeared at only three other U.S. sites. Displaying specimens from major museums around the world, Amber featured 145 fossils of extraordinary beauty, significance and rarity – insects, bits of vegetation, even a tree frog caught in resin and preserved for millions of years. To deepen visitor appreciation of the exhibit's 80 decorative objects, Russian master craftsmen carved amber on site.

NATURAL HISTORY MUSEUM

Early Childhood Center

Deinonychus in Life Through Time exhibit

Rugs of Teec Nos Pos June Anderson

Chamaeleo jacksonii Caroline Kopp





Rugs of Teec Nos Pos

Planetarium Theater Susan Middleton

Visitors Reading in Cowell Hall

Earth and Space Hall Susan Middleton

Similarly, the Academy displayed a spectacular private collection of the colorful Navajo rugs peculiar to the Teec Nos Pos region of Arizona. In addition to the display of Jewels of the Navajo Loom, Navajo weavers demonstrated their artistry and taught education department interns how to demonstrate the distinctive weaving, as well.

Herbst Lecture Series

The Herbst Lecture series brought Tony Hillerman, Tim Cahill, Peter Matthiessen, Drs. C.J. Peters and Sylvia Earle and other commentators to a broad community audience. Richard Dawkins, Ph.D. was this year's annual Lilienthal Distinguished Lecturer, a designation established in 1982 to honor philanthropist Claire Matzger Lilienthal.

The Morrison Planetarium

The first major planetarium designed and built entirely in the U.S. – its hand built star projector is legendary in the planetarium community – the Morrison Planetarium celebrated its 45th Anniversary in unparalleled style: the universe sent a comet. Hale-Bopp not only made an appearance, the comet's co-discoverer Alan Hale did, too. Along with scientists from the Jet Propulsion Laboratory, Neil Tyson of New York's Hayden Planetarium, and others, Hale was among the noteworthy speakers of the Benjamin Dean Lecture series.

Planetarium presentations on and "front porch" observations of the comet were hardly the only innovations. The Planetarium introduced a new show entitled "Great Shakes" focused on other planets' seismic activity and another called "Other Worlds" explaining recently discovered solar systems. Programs around the Mars Pathfinder landing, the Perseid meteor shower, and a major solar flare also captured the public's imagination. Morrison Planetarium experts were sought after by both amateur star-gazers and media hungry for information on these highly visible heavenly events.

Attendance at the Planetarium topped 118,900. More important, however, 43,750 of that number were preschool to high school students who – thanks

MORRISON PLANETARIUM

to newly developed school packets covering the vocabulary of astronomy, exercises on

intergalactic concepts, and revised show materials for "Neighbors in Space" – developed a deeper appreciation of the universe.

That universe was sharpened by technical improvements which permit

more precise alignment of night sky images and digital – rather than hand – audiotape editing. At the Hume Observatory at Pepperwood, a donated reflecting telescope was also recalibrated, resulting in its best performance in a decade.

The Steinhart Aquarium

The moment airline passengers enter Gateway D at San Francisco International Airport, they're visitors to the Steinhart Aquarium. The three displays in the Aquarium's popular airport exhibition illuminate underwater life of three major habitats: the coral reef of the Pacific, fishes of the Amazon, and cichlids of Malawi.

The Touch Tidepool, penguin and other aquatic exhibits of the main Aquarium itself – which showcase one of the largest collections of vertebrate species in North America – continue to amaze and delight visitors. The most important work of the Aquarium, however, goes on behind the scenes.

The Academy's captive breeding programs are part of a world-wide effort to save varied endangered aquatic species. Joining efforts to preserve endangered penguins and winter-run Chinook salmon is a new seahorse breeding project, with habitat construction underwritten, in part, by Mutual of Omaha's Wildlife Heritage Center.

Steinhart's seahorse conservation effort first required a six month investigation of how to grow the food sources required by the tiny fish at each stage of their development. Threatened by the international pet trade as well as their use in Asian medicines, wild seahorse populations will one day get an injection of new blood through the release of captive-bred animals.

Also underway is preliminary work on a conservation program focused on three fishes native to Madagascar. This captive breeding program parallels new research work slated to begin in 1998 on that endangered African island.

STEINHART AQUARIUM

Tidepool Touch Tank Caroline Kopp

Blackfooted penguin, *Spheniscus demersus* Susan Middleton





Star projector, Morrison Planetarium Susan Middleton



Sharks Steinhardt Aquarium

1996/97 at a glance

Natural History Museum

- Number of visitors: 966,000
- Exhibit attendance: *Amber* – 208,000; *Jurassic* – 215,000
- Non-docent volunteers: 226, who worked 3706 hours

Steinhart Aquarium

- Size of collections: 7,000 specimens; 600 species
- Research/breeding projects: 6 in progress
- Student visitors/visiting scientists: 450
- Volunteers: 155 who contributed 5,386 hours
- Seminars, lectures and presentations made: 26

Morrison Planetarium

- Number of visitors: 118,907
- Students at school shows: 43,750
- Laserium shows: 538 with total audience of 36,811
- Audience for Dean Lecture Series: 3,292



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California Academy of Sciences



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The California Academy of Sciences' worldwide research and conservation work, its Bay Area education outreach, and its public exhibition spaces would languish were it not for the generosity of the Academy's legions of members and donors. From July 1996 through July 1997, contributions donated to the Academy totaled \$9,304,970 – including \$3,539,694 in unrestricted gifts, \$3,957,425 in restricted funds, and \$1,807,851 toward the endowment. Our gratitude knows no measure.

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 Cornelius H. Muller, Botany
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 Zoology
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Each year, one prominent member of the Fellows is singled out for special recognition. At the annual Fellows meeting in October, 1997, the institution's highest honor – the Fellows' Medal – was bestowed on Dr. Frank A. Pitelka in recognition of his outstanding scholarship and contributions to the fields of natural history, particularly in the areas of ecology, behavior, and ornithology. An Academy Fellow since 1961, Dr. Pitelka is Professor Emeritus of the Departments of Zoology and Integrative Biology, and the Museum of Vertebrate Zoology of the University of California at Berkeley.



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Some 1,114 individuals, who last year contributed 44,534 hours of volunteer work to the Academy, are absolutely integral to the success of our research efforts, education programs and exhibitions. They serve as trained docents and exhibit staff; assist teachers and classrooms full of children; support researchers in the Biodiversity Center and Research Library; catalog specimens; oversee the Touch Tidepool; and staff the Information Desk. Every department benefits from the invaluable services of these dedicated individuals. Their gifts of time and expertise – and infinite patience with scientists and the public, alike – are irreplaceable. We thank them most sincerely for their selflessness and dedication.

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 Betty Pollock, Hu JP HL SP BR Am
 Do
 Terence Pon, TP
 Joan Pont, HL Do
 Margaret Poole, JP HL SE Do BR
 Susan Poole, SE Do JP HL BR
 Barbara Pope, IG
 Michael W. Pope, Ic
 Brad Post, Aq
 Jenny Pramuk, Aq
 Kate Prator, BR
 Ann Preece, Do LS
 Ellen Price, Do
 Steven Price, SE BR
 Dolores Priem, BC
 Judy Prokupek, Do
 Robin Prothro, BR Bo
 Serena Puga, PD
 Steven Pullman, IG
 Johanna Purcell, DR
 John Qin, TP
 Charlene Quan, CS
 Jennifer Quan, Ed
 Christopher Quock, Aq
 Jane Radcliffe, BC IG
 Sabrina Ramirez, BC
 Jonathan Randall, PD
 Kamallesh Rao, BC
 Megan Rathfon, OM
 Andrea Raynor, JP
 Elizabeth Reed, BC
 Kenneth Reed, TP
 Maddox Rees, HL
 Kathy Reichardt, Do
 Anita Reichel, ID
 Cecil Reichert, LS
 Louise Reiter, Sp SE Do Hu HI
 TP BR
 Edward Remedios, Do HL
 Mary Renaker, BR Do SE

Volunteer Melissa Chaney with a harbor seal.



Charles Renshaw, Aq
 Erin Rentz, LS
 Valerie Revels, Li
 Jernajeol Reyes, BC
 Rebecca Reyna, DR PI
 Andrew Reynolds, BC
 Hugh Reynolds, SE Do BR
 Julian Rhine, Do
 Jean Ribardo, En
 Alexandrine Rich, Bo
 Barbara Rich, SE JP Mm CI
 Diane Richards, CD
 Hunter Richards, BC
 Elizabeth Rieger, Do
 Gino Rinaldi, CD
 Glen Risdon, Li
 Lois Roach, SP
 Janet Robbins, Do
 Jay Roberson, PI
 Rose Roberto, HL Do
 Mary Roberts, HL Do
 Shannon Robins, Ex
 John Rocco, Aq
 Hase Rodenbaugh, BC CD
 Helen Rodgers, HL Do
 Patricia Rodgers, SE
 Manuel Rodriguez, CD
 Stacey Rodriguez, SE CI
 Barbara Rogers, Do
 Ernest Rogers, Do
 Bridget Rogers, Aq
 Joseph Rogers, BC
 Angela Rojas-Graham, ID
 Jeanne Rose, AE Do
 Anne Rosenthal, PD
 Tinka Ross, IS
 Sissy Rossi, Do HL
 Bill Roten, BC
 Lois Roth, BR Do
 Rio Roth-Barreiro, TP DR CH
 Daniele Rubcic, Aq
 Elsa Ruckert, Bo
 Rebecca Ruiz, PI
 Dorothy Rumney, Do
 Jim Runner, AE Do
 Thea Ruzette, CI CI
 Jessamyn Sabbag, TP
 David Salgado, Ex
 Nora Sall, BC
 Talia Salter, Aq
 Sergei Samborski, BC
 Grace Samson, Li
 Ivan Samuels, OM

Andrew Sanchez, BC
 Doris Sanchez, ID
 Alexandra Sangmeister, OM
 Andrea Sanguine, BC
 Raymond Sante, Aq
 Ben Saturen, LS
 Victoria Saxe, En
 Judy Schaefer, DR
 Maria Schaefer, IG
 Aja Schieman, JP
 Marjorie Schmelzer, IG
 Herbert Schmidt, Do
 LaVerne Schmidt, Do
 Morgan Schmidt, Ex
 Harold Schneringer, PI
 Julia Schoellenbach, DA
 Jacqueline Schonewald, OM
 Mary Schreiber, DR
 Wende Schwake, Aq
 Paola Scippa, CD Aq
 Harry Scott, SP
 Norman [Jerry] Scott, Do
 Ruth Scott, Do
 Linda Seabrooks, En
 Sara Seaton, Ed
 Frankie Seffens, Do
 Lesley Segedy, Do
 Joan Serra, ID
 Jennifer Setten, Ed
 Holly Severson, IG
 Theresa Sevieri, Li
 Angela Shayevich, CH DR
 Albert Shell, Do
 Fred Shelton, LS OM
 Peter Shepard, Ed
 Carrie Shepherd, PI
 Maggie Shepherd, DR
 William Shepherd III, Aq
 Jessica Sheppard, OM
 Walt Shepps, Li
 Robert Sheridan, Mm
 Dan Sherman, Aq CI
 Anita Sheung, DR
 Naomi Shibata, PW
 Charles Shimooka, Aq
 Mary Shirley, Aq
 Jack Shnider, Do HL
 Michelle Shouse, IG
 Rodney Shu, CI
 Hannah Silver, BC
 Marjorie Silver, Do
 Arthur Simpson, BC
 Ron Simpson, Bo

Kate Sims, An
Margaret Singer, JP
Beth Singleton, Dv AS
David Siu, BC Li
Christopher Smith, Aq
Clyde Smith, Do
Diana Marie Smith, BR
Jeffrey Smith, En
Jenny So, TP
Katrina Socco, En
Maria Solis, Do
Kristen Sorensen, Aq
Eriza Sorenson, BC
Sarah Soule, DR
Connie Spanier, HL Do SE
Patricia Sparling, Aq
Carol Spinali, Do
Sherry Spitzer, BC
Dimitri Spodine, Aq
Danette St. Onge, Ex
Cecine Stadden, Bo
Christina Stahlkopf, TP CH DR
Barbara Stanton, Do
Cathleen Stark, Li
Tracy Starke, Am CI SE
Valentin Stayer, BR
Nancy Stearns, Hu BC Sp DA
Erin Steele, DA
Ted Steffens, AE
Kathleen Steinberg, Do
Judy Stemen, Ex
Max Stepanian, Aq
Tanya Stepanian, Do
Tom Sterner, BC
Jeff Stizza, ID
Desy Stoyanov, CI SE BR
Eric Strand, Aq
Scott Strayer, SE
Mila Stroganoff, HL Do
Amelia Sugarman, Do
Maile Sullivan, TP
Alice Sunshine, PI
Shawn Sutherland, Aq
Joan Suzio, Do
Marc Swanson, Aq
Joshua Swartz, CD
Nicole Swartz, An
Carolyn Swett, IG
Paul Swiatko, CD
Alan Swithenbank, BC
Isidore Szczepaniak, OM
Edith Tabak, BC
Nellie Taha, SE
Evangeline Tai, Ex
Gene Takagi, BC
Chikara Takahashi, BC
Marlene Tam, BR
Marilena Tamburello, Ex
Mary Tarlecki, Aq
Andrew Templeman, BC
Kristen Thomas, An
Marilyn Thompson, Am
Margot Timberlake, Do HL
Heather Tine, BC LS
Fong-Yi Ting, Li
Edith Tirado, DR CI
Kate Tomlin, BR
Fujita Tomotake, Ex
Alice Tong, Do

David Toren, Bo
Louise Torracco, Do SE HL
Nicole Torres, CD
Eric Tosaris, HL Do
Michael Toy, DR
Sharon Toy-Choutka, BC OM
Carole Trapnell, Do
Leilon Tsue, Ph
Jennifer Tucker, Aq CI
Patricia Tucker, Do
Jonathan Tupy, En
Jay Tustin, CD
Carol-Ann Uetake-Shapiro, BC
William Urbani, HL Do
Veronica Uy, CS
Jenny Uyemura, DR
Luke Vairo, Aq
Linda Vallee, Hu
Pam Van der Leeden, OM
Gloria Vasquez, Ed
Robert Venegas, IS
Patricia Venturino, ID
Joan Verdi, Do
Cleo Vilett, TP
Denise Villa, Hu
Nick Villa, Hu
Eleanor Visser, Do Os
Frank Vuong, Op
Kathy Wade, Sp
Michelle Wagle, BC TP
Aaron Walburg, CS
Johnny Walker, Aq
Thomas Walker III, DR JP
Kim Wallace, Bo
Sara Marie Wallace, BR
Darren Wan, TP
Sindy Wan, DA
Nini Ne-Chiao Wang, DR Mm PI
Jeff Warren, Ex

Tamara Warren, Aq
Julie Watanabe, CS
Delcey Watkins, Do HL
Wesley Joseph Watkins IV, TP
Errol Watson, BC Aq
Kathleen Watson, CI Aq
Jeremie Wattellier, Ed PI
Barbara Webber, HL DR Do SE
Merna Wechsler, SE
Xuan (Ray) Wei, BC
Daniel Watson Weller, IG
Terri Werner, IG
Ann Weybright, ID SE LS
Walter Weybright, SE
Sonya White, OM
Alfred Wilcox, Do
Lori Wilder, Aq
George Wilhelmsen, BC
Shelly Willard, BC
Eva Williams, SP
Kimberly Williams, PD
Seaberry Williams, IG
Marcella Williamson, BR HL Do
Mary Willis, BC DR
Laura Wilms, Ed
Douglas Wilson, HL Do
Anna Wojdyla, SE
Harold Wollenberg, Op IS
Diane Wong, En
Eva Wong, BC
Judy Wong, Am
Kimberly Wong, He
Lillian Wong, Do HL
Ophelia Wong, Do
Sherrie Wren, Bo
Doug Wright, PD
Freida Wright, SE PI
Cynthia Wuketich, SE
Jonathan Xiong, SE Ed Mm

Eric Yan, Ed
Angela Yang, DR
Elisa Yao, DR
Nathaniel Yates, JP
May Yee, Dv
Susanne Yim, DR
Kayo Yokota, Ex
Earl Yorkey, CD
Michael Young, Li SE
Nyda Young, Bo
Tomme Young, BC
Gloria Yu, CS
Lydia Yu, BC
Rosemary Saulino Yu, EC
Sherry Yu, DR
Anthony Yuen, DA
Flora Zagorites, ID SE
Jerry Zagorites, SE Ex
Steven Zarit, CD AQ
Amber Zarnett, Am
Xiang Zhou, DR Mm SE
Cay Zilka, Do
Robert Zuparko, En

Assignments

AE Academy Escort
Am Amber*
An Anthropology
Aq Aquarium
AS Academy Store
BC Biodiversity Center
Bo Botany
BR Bears*
CD Certified Diver
CI Clerical
CS Computer Services
DA Dinosaur Adventure*
Do Docent
DR Discovery Room
Dv Development
EC Early Childhood
Ed Education
En Entomology
Ex Exhibits
He Herpetology
HL Highlight Docent
Hu Hunters*
Ic Ichthyology
ID Information Desk
IG Invertebrates & Geology
IS Instrument Shop
JP Jurassic Park*
Li Library
LS Library Special Collections
MM Membership
OM Ornithology & Mammalogy
OP Operations
OS Osher Laboratory
PD Pacific Discovery
PH Photography
PI Public Information
PL Planetarium
PP Public Programs
PV Pepperwood
SE Special Events
SP Scientific Publications
Sp Spiders*
TP Tidepool
VS Volunteer Services
*Special Exhibits

Volunteer Sherrie Wren



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Meikle, W.E., F.C. Howell, and **N.G. Jablonski**, eds. (1996). Contemporary Issues in Human Evolution. *Memoirs of the California Academy of Sciences*, No. 21.

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Antropov, V.A. and **W.J. Pulawski**. 1996. *Pison antiquum*, a new species from Dominican amber (Hymenoptera: Sphecidae). *Journal of Hymenoptera Research* 5:16-21.

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Kavanaugh, D.H. and V.G. Shilenkov. 1996. A remarkable new species of *Nebria* (Coleoptera: Carabidae: Nebriini) from North Korea. *Proceedings of the California Academy of Sciences*, 49:151-160.

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Scientific Publications:

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Drewes, R.C. 1997. Life in the Wild: Hot Spot for Frogs. *SWARA* 20:27-30.

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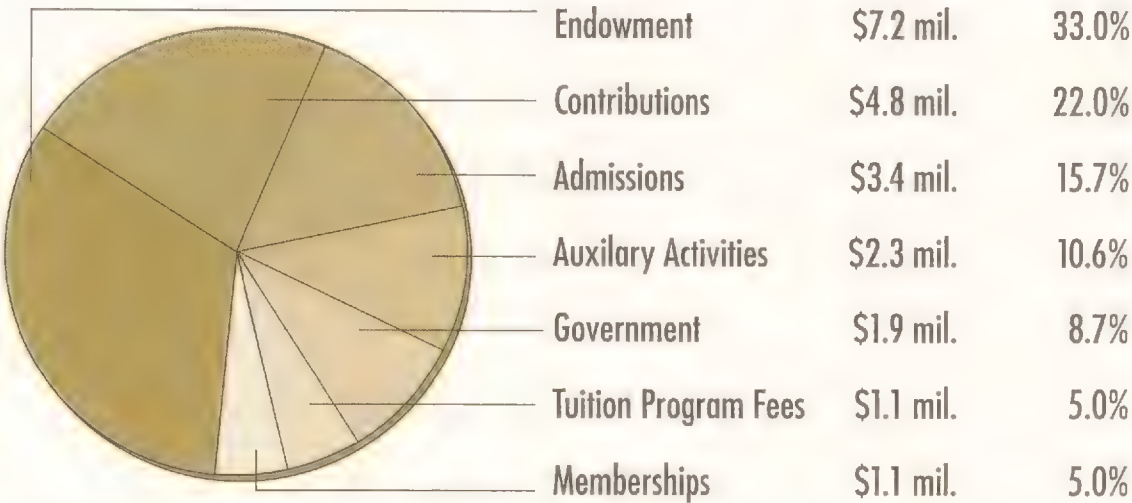
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Nicole Anderson Ellis
(to 12/96)
Vivian Woodruff (from 2/97)
Intern Program Assistant
Melissa Marks (from 9/96)
Teacher and Visitor Services
Coordinator
Susan Douglas
Teacher Services Assistant
Janet Lopez (to 9/96)

Balance Sheet

June 30, 1997 with comparative totals for 1996

					Total All Funds
Assets	Operating	Plant	Endowment	1997	1996
Cash & Equivalents		926,056	402,529	1,328,585	594,112
Investments in Marketable Securities	5,474,766	828,506	97,201,354	103,504,626	86,873,197
Receivables:					
Research Grants	149,375			149,375	31,960
Interest & Dividends	342,886	3,441		346,327	325,572
Other	146,971	4,423	1	151,395	226,334
Contributions	1,436,295	862,987		2,299,282	1,756,000
Inventory	565,029			565,029	497,366
Prepaid Expenses	432,813			432,813	423,407
Investments Held in Trust			4,033,510	4,033,510	4,044,764
Property & Equipment at cost, less Accumulated Depreciation		35,001,937		35,001,937	34,178,366
Total Assets	8,548,135	37,627,350	101,637,394	147,812,879	128,951,078
Liabilities & Net Assets					
Accrued Expenses & Other Liabilities	2,643,937	30	5,899	2,649,866	1,921,144
Deferred Income	109,264			109,264	193,786
Annuities Payable			1,977,291	1,977,291	1,877,834
Total Liabilities	2,753,201	30	1,983,190	4,736,421	3,992,764
Unrestricted Net Assets					
Available for Operations	3,021,037		5,607,150	8,628,187	5,950,596
Designated for Long-Term		35,001,937		35,001,937	34,178,366
Designated for Endowment			78,462,622	78,462,622	64,541,620
Total Unrestricted	3,021,037	35,001,937	84,069,772	122,092,746	104,670,582
Temporarily Restricted Net Assets	2,773,897	2,625,383	1,410,718	6,809,998	5,984,200
Permanently Restricted Net Assets			14,173,714	14,173,714	14,303,532
Total Net Assets	5,794,934	37,627,320	99,654,204	143,076,458	124,958,314
Total Liabilities & Net Asset	8,548,135	37,627,350	101,637,394	147,812,879	128,951,078

Revenue: \$21.8 million

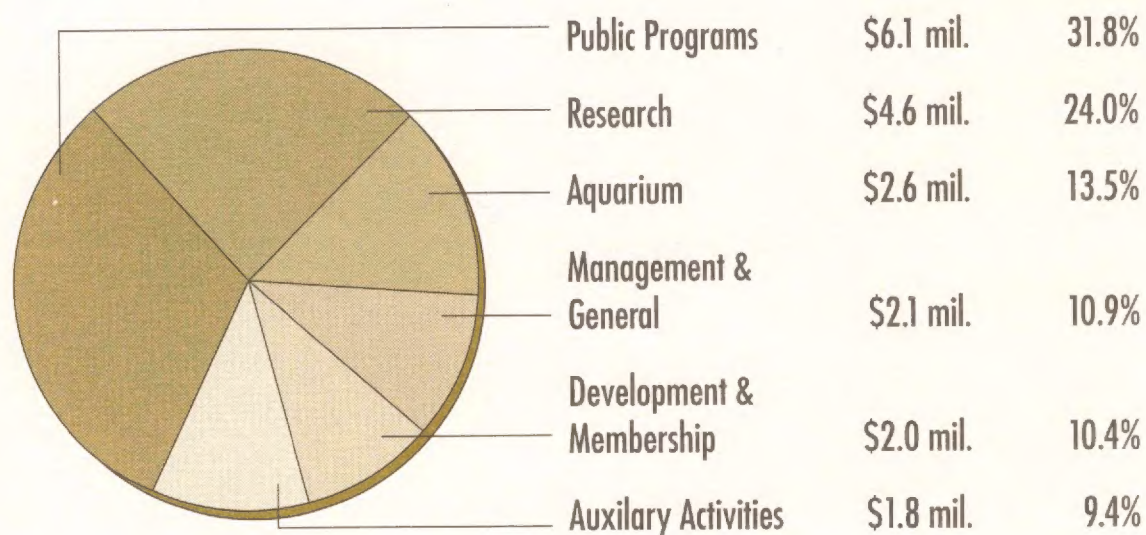


Statement of Activities

Years Ended June 30, 1997 and 1996

	Operating	Plant	Endowment	1997	Total All Funds 1996
Changes in Net Assets					
Revenue & Gains					
Admissions	3,352,277			3,352,277	3,114,384
Contributions	4,815,339	883,096	1,807,852	7,506,287	6,076,736
Memberships	1,074,895			1,074,895	1,058,482
Tuition & Program Fees	1,125,400	900		1,126,300	988,630
Auxiliary Activities	2,311,298			2,311,298	2,017,776
Government Grant Income	339,910			339,910	482,048
City & County of San Francisco	1,561,177	36		1,561,213	1,701,294
Investment Income	2,031,846	39,958		2,071,804	2,233,191
Net Realized and Unrealized Gains on Long-Term Investment	5,206,010	88,397	14,658,342	19,952,749	11,734,471
Total Revenue & Gains	21,818,152	1,012,387	16,466,194	39,296,733	29,407,012
Expenses					
Research	4,463,159	497,939		5,141,098	4,754,703
Public Programs	6,144,799	520,702		6,665,501	5,103,316
Aquarium	2,566,593	288,805		2,855,398	2,483,074
Development & Membership	2,052,845	545,756		2,598,601	1,919,384
Auxiliary Activities	1,754,661	55,485		1,810,146	1,712,657
Management & General	2,059,474	48,371		2,107,845	1,990,443
Total Expense	19,221,531	1,957,058		21,178,589	17,963,577
Transfers Between Funds					
Capital Expenditures	(726,094)	726,094			
Other Transfers	1,514,850	750,441	(2,265,291)		
Increase/(Decrease) in Net	3,385,377	531,864	14,200,903	18,118,144	11,443,435
Net Assets Beginning of Year	2,409,557	37,095,456	85,453,301	124,958,314	113,514,879
Net Assets End of Year	5,794,934	37,627,320	99,654,204	143,076,458	124,958,314

Operating Expenses: \$19.2 million



Cover

Armillary Sphere

A forerunner of modern planetariums such as the Academy's own Morrison Planetarium, devices like this were used to represent the celestial sphere stripped down to its basic elements: the celestial equator, the local meridian, and the apparent path of the Sun, Moon, and planets. Before the invention of the telescope in the early 1600s, the armillary sphere was one of the principal tools of astronomy.

The term "armillary sphere" comes from the Latin word "armilla," which means "bracelet" or "ring." Some models included additional rings representing hour circles and the horizon. They could also serve as sundials.

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